PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of)
)
J. ERIC BERGE ET AL.)
)
Serial No.: 09/364,794)
)
Filed: July 30, 1999)

For: VACUUM PNEUMATIC SYSTEM FOR CONVEYANCE OF ICE

Group Art Unit: 3651

BRIEF ON APPEAL UNDER 37 C.F.R. §§ 1.192

Hon. Commissioner for Patents
P.O. Box 2327
Arlington, VA 22202

Attention: Jeffrey A. Shapiro
Examiner

Dear Sir:

This Appeal Brief is filed under the provisions of 37 C.F.R. § 1.192 in response to the Final Rejection of Claims 1, 11, 39, 59, 65, 72, 97, 102, 105, 126, 128, 138, 145, 151 and 164 in the Office Action of November 1, 2001. A Notice of Appeal was filed on March 1, 2002. An Advisory Action was issued by the Examiner on March 7, 2002, refusing entry to amendments after final rejection offered by Appellants on December 24 and 25, 2002.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents , Washington, D.C. 20231 on:

April 24, 2002
(Mailing Date)

Melissa Leffler
(Name of Person Certifying)

(Signature)

April 24, 2002
(Date of Signature)

PTO/SB/17 (11-00)
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FEE TRANSMITTAL for FY 2001

Patent fees are subject to annual revision.

TOTAL AMOUNT OF PAYMENT ($) 430

Complete if Known	
Application Number	09/364,794
Filing Date	07/30/1999
First Named Inventor	J. ERIC BERGE
Examiner Name	Jeffrey A. Shapiro
Group Art Unit	3651
Attorney Docket No.	7480-PA1CP2

METHOD OF PAYMENT

1. ☐ The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:

Deposit Account Number: 02-4070

Deposit Account Name: Brown, Martin, Haller & McClain

☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

☐ Applicant claims small entity status. See 37 CFR 1.27

2. ☒ **Payment Enclosed:**

☒ Check ☐ Credit card ☐ Money Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
101	740	201	370	Utility filing fee	
106	330	206	165	Design filing fee	
107	510	207	255	Plant filing fee	
108	740	208	370	Reissue filing fee	
114	160	214	80	Provisional filing fee	

SUBTOTAL (1) ($) 0

2. EXTRA CLAIM FEES

	Extra Claims		Fee from below	Fee Paid
Total Claims		-20** =	X	= 0
Independent Claims		- 3** =	X	= 0
Multiple Dependent				= 0

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
103	18	203	9	Claims in excess of 20
102	84	202	42	Independent claims in excess of 3
104	280	204	140	Multiple dependent claim, if not paid
109	84	209	42	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet	
139	130	139	130	Non-English specification	
147	2,520	147	2.520	For filing a request for *ex parte* reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	110
116	400	216	200	Extension for reply within second month	
117	920	217	460	Extension for reply within third month	
118	1,440	218	720	Extension for reply within fourth month	
128	1,960	228	980	Extension for reply within fifth month	
119	320	219	160	Notice of Appeal	
120	320	220	160	Filing a brief in support of an appeal	320
121	280	221	140	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive - unavoidable	
141	1,280	241	640	Petition to revive - unintentional	
142	1,280	242	640	Utility issue fee (or reissue)	
143	460	243	230	Design issue fee	
144	620	244	310	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Processing fee under 37 CFR 1.17(q)	
126	180	126	180	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	740	246	370	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	740	249	370	For each additional invention to be examined (37 CFR § 1.129(b))	
179	740	279	370	Request for Continued Examination (RCE)	
169	900	169	900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 430

SUBMITTED BY				Complete (if applicable)	
Name (Print/Type)	James W. McClain	Registration No. (Attorney/Agent)	24,536	Telephone	(619) 238-0999
Signature				Date	April 24, 2002

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/364,794
Filing Date	07/30/1999
First Named Inventor	J. ERIC BERGE
Group Art Unit	3651
Examiner Name	Jeffrey A. Shapiro
Total Number of Pages in This Submission	
Attorney Docket Number	7480-PA1CP2

ENCLOSURES *(check all that apply)*

- [X] Fee Transmittal Form
  - [X] Fee Attached
- [ ] Amendment / Response
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Response to Missing Parts/ Incomplete Application
  - [ ] Response to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Assignment Papers *(for an Application)*
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition Routing Slip (PTO/SB/69) and Accompanying Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Small Entity Statement
- [ ] Request for Refund
- [ ] After Allowance Communication to Group
- [ ] Appeal Communication to Board of Appeals and Interferences
- [X] Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- [ ] Proprietary Information
- [ ] Status Letter
- [X] Additional Enclosure(s) *(please identify below)*:
  - Return Postcard

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	James W. McClain
Signature	
Date	April 24, 2002

CERTIFICATE OF MAILING

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Typed or printed name	Melissa J. Leffler		
Signature		Date	April 24, 2002

REAL PARTY IN INTEREST

The real party in interest is the Appellants' Assignee, Lancer Ice Link, L.L.C.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences related to this appeal or application.

STATUS OF CLAIMS

Claims 1, 11, 39, 59, 65, 72, 97, 102, 105, 126, 128, 138, 145, 151 and 164 are expressly present on this appeal, these claims all having been finally rejected. No claim has been cancelled or allowed. The two principal independent claims are Claims 1 (apparatus) and 126 (method). For brevity herein and identification where needed, these fifteen claims will frequently be referred to herein collectively as "the appealed claims."

This application was filed with Claims 1-163. Early in the prosecution the Examiner rejected the claims under 37 C.F.R. § 1.75(b) on the ground of multiplicity and prolixity, and required that Appellants reduce the number of claims to either 10 or 20 (April 20, 2000; Paper No. 4). After some intermediate correspondence between Appellants' attorney and the Examiner, the appealed claims were settled on for prosecution (see Papers 8 and 9) and the remaining claims were withdrawn as non-elected (Paper No. 9)[1].

One of the issues on this appeal is the proper status of the non-elected claims[2]. Appellants, although provisionally reducing the number of claims to expedite the prosecution of this application, have never acquiesced in the Examiner's rejection of the overall claim structure as multiplied or prolix, and believe that the "non-elected" claims are properly an integral part of the claim structure of this application; see Paper No. 6; July 13, 2002 and Paper No. 8; August 9, 2000. This issue will be treated below.

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[1] Claim 164 was added at that time. Claim 126 was inadvertently not listed as retained in Papers Nos. 8 and 9, but it was inherently retained in the amendment of Claim 128. The inadvertent omission was soon noted and Claim 126 was thereafter included in the examination, and has thereafter been treated by both the Examiner and Appellants as part of the "appealed claims."

[2] Claims 2-10, 12-38, 40-58, 60-65, 66-71, 73-96, 98-101, 103-104, 106-127, 129-137, 139-144, 146-150 and 152-163.

STATUS OF AMENDMENTS

Following the final rejection in the Office Action of November 1, 2001 (Paper No. 14), Appellants proposed amendments to Claim 1 (December 24, 2001; Paper No. 16) and Claim 126 (December 25, 2001; Paper No. 17). A clarifying amendment to lines 4-19 of page 4 of the Specification, relating to identification of the Benny et al. U.S. Patent No. 4,394,259 at issue herein was also submitted in Paper No. 16. Those amendments were discussed by telephone with the Examiner shortly after their submission, and the Examiner informally indicated that they did not place the application in condition for allowance.

In the Advisory Action dated March 7, 2002, the Examiner confirmed that indication and denied entry of the amendments on the ground that they "are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal."

Appellants disagree with the Examiner's conclusion. Therefore the arguments herein will treat both entry and non-entry. Appellants will demonstrate, however, that the appealed claims are allowable *whether or not* the proposed amendments are made to Claims 1 and 126.

There are no other outstanding amendments which have been submitted but not entered.

SUMMARY OF THE INVENTION

The invention described and claimed herein is a novel and unique pneumatic conveyance system *for ice* which is structured to operate and which does operate *entirely under negative air pressure (i.e., under vacuum) throughout its entire extent* [page 1, lines 10-12; page 4, lines 29-32; page 6, lines 3-6 and 19-24; page 7, lines 9-19; page 8, lines 9-23.]

The "ice" as relevant herein refers to ice "pieces," primarily ice cubes [page 11, lines 12-23], which are transported pneumatically in the system under vacuum from a central ice maker or ice supply bin to remote ice dispensing or use locations, such as beverage dispensers in fast food outlets, customer ice bins such as found in hotels and motels,

restaurant salad bars, hospital ice supply bins and the like [page 4, line 29 - page 5, line 21].

Use of this invention eliminates the need for expensive, personnel-intensive and generally unsafe and unsanitary manual transport of ice (which may be typified by fast-food restaurant employee carrying a bucket of ice through the restaurant to dump into the ice hopper of a beverage dispenser) [page 1, line 29 - page 2, line 18; page 3, lines 19-27]. It also insures that ice can be supplied in a timely manner to the remote locations, since for food preservation (such as on a salad bar) or in medical settings it is important to replenish melted or dispensed ice before the ice quantity at the remote location becomes unduly depleted [page 2, lines 19-29; page 3, lines 11-18].

Numerous embodiments and supplemental structures are described and claimed in the present invention. They can be understood by examination of the drawings and are well-described in the Specification. For the purpose of this appeal it is not necessary to enumerate them, but they are all properly defined in the claims (both the appealed claims and the non-elected claims). As examples, attention is directed to use with beverage dispensers (Figures 6, 17 and 33), with automatic weight-activated collector/dispensers (Figures 6, 7A-12B, storage bins (Figure 35), air lock ejectors for filing large containers with the transported ice (Figures 20 and 25), in-line diverters to route ice through 2, 3 or 4 alternative conduit paths (Figures 26A-28B).

There are numerous pneumatic transport systems in the prior art, most of which operate under elevated (i.e., greater than atmospheric) air pressures. Such systems cannot be used for conveyance of ice, because of the fragility of the ice cubes. Those high pressure systems in effect hurl the ice through the conduits, causing continual impacts of the ice with the conduit walls (especially at turns) and at the terminal containers, shattering the ice and reducing it to unacceptable and generally unusable fragments. It is a well-known scientific principle that the more fragmented the ice, the faster it will melt, so that the high-pressure conveyance systems deliver ice which has a severely reduced time period of usability.

The present vacuum system avoids such problems, since it transports the ice by

pulling it through the conduits, which has the benefit of guiding the ice through turns, diverters, wyes and other routing within the system, minimizing destructive impacts within the system. It also results in much gentler delivery of the ice at the remote locations, since instead of being jetted out of the end of the conduit into the receptor (like water out of a fire hose) with a high noise level, the ice cubes are simply freed from the vacuum-motivated motion and drop quietly by their own light weight into the receptors [page 6, lines 3-6].

There have been a few small vacuum-operated conveyance systems in the prior art, but these have all been very short range, single route systems, and all have been designed and disclosed for movement of non-fragile carriers or other large items. Systems have also been known in the prior art which are primarily high-pressure systems, but which have short vacuum segments, such as use of an aspirator device to draw ice cubes out of a supply bin and into the high-pressure, high-velocity air conveyance stream. (All of these prior art variations are at issue in the present appeal and will be discussed in detail below.)

No prior art system, however, has been disclosed which utilizes vacuum as the exclusive motivating means for moving the ice through the system and which can be configured into multiplicities of routes and paths through which the ice can be conveyed and delivered as usable, intact ice cubes. The present all-vacuum system can and does provide these functionalities.

ISSUES

1. Anticipation under 35 U.S.C. § 102(b) over Benny et al:

The Examiner has rejected Claims 1, 11, 39 and 126 as anticipated by Benny et al, U.S. Patent No. 4,394,259 ("Benny"). Appellants submit that Benny's disclosure a) does not disclose an all-vacuum-motivation conveyance system, b) is not applicable to conveyance of ice for human consumption, c) represents what those skilled in the art would consider entirely non-analogous art, d) is of a system with a significantly different structure of apparatus from the apparatus in the claimed system, and e) is of a system whose method of operation is significantly different from the operation of the claimed method.

2. Obviousness under 35 U.S.C. § 103(a) over Benny in view of Wade or Pink et al:

The Examiner has rejected Claims 59, 72, 97, 102, 105, 128, 138, 145 and 164 as obvious over Benny in view of Wade, U.S. Patent No. 3,877,241, and Claims 65 and 151 as obvious over Benny in view of Pink et al. ("Pink"), U.S. Patent No. 3,798,923. Appellants submit that these combinations do not make Appellants' claimed apparatus and method obvious to one skilled in the art, since a) Benny has the deficiencies described above, which renders it unsuitable as basis for a § 103(a) rejection, and b) merely adding minor items from the secondary references, such as Wade's withdrawal of ice from supply bin or use of cleaner in the conduits, or Pink's ice debridger, does not overcome the fatal deficiencies of Benny to product viable § 103(a) rejections.

3. Alleged Multiplicity and/or Prolixity of the Claim Structure under 35 U.S.C. § 112, ¶ 2, in view of 37 C.F.R. § 1.75(b):

This issue has been dormant since the early part of the prosecution, as discussed above in the "Status of Claims" section. However, in order to complete resolution of this case Appellants submit that a decision regarding incorporation of the non-elected claims is necessary.

Appellants submit that the claim structure is neither unduly multiplied nor prolix. An applicant is permitted to have as extensive a claim structure as desired, if appropriate in view of the prior art and the scope of the application's invention. Appellants submit that the present claims fairly, reasonably and accurately represent the extent of Appellants' invention in its various apparatus and method embodiments. All of the claims are distinct; no claim is the equivalent of any other claim. Mere similarities in some pairs of claims do not equate to undue multiplicity or prolixity.

GROUPING OF CLAIMS

All claims in this case involve the same concept of a unique functionally all-vacuum ice conveyance system. Claims 1-125 (including appealed Claims 1, 11, 39, 59, 65, 72, 97, 102 and 105) are apparatus claims defining the system, while Claims 126-164

(including appealed Claims 126, 128, 138, 145, 151 and 164) are method claims defining the method of operation of the system. Since the two sets of claims are closely related, the claims will all stand or fall together.

ARGUMENTS

Appellants will concentrate herein on Claims 1 and 126, since if they can be shown to be allowable, all of the other appealed and non-elected claims are also allowable, since they all depend, directly or indirectly, from Claim 1 or Claim 126.

A. Anticipation over Benny; Claims 1, 11, 39 and 126

In the final rejection, pages 2-3, the Examiner defines what he asserts as the applicability of the Benny disclosure to Appellants' Claim 1 by copying Claim 1 with Benny's element numbers inserted, as follows:

> 1.) a hollow elongated ice conduit (38, 46, 88, 94, 96, and 98) connecting said source (22) of ice and said remote location (26) and providing ice communications therebetween;
> 2.) a receptor (25 or 106) at said remote location for receiving said ice (note tables (element 26) could be reasonably construed as receptors or air lock (106) could be construed as a receptor in that it builds up "ice" particles behind it until the barometric pressure is overcome by the weight of the built-up mass of ice particles);
> 3.) a vacuum pump (32) in fluid communication through a vacuum line with said receptor for withdrawing air from said conduit and creating a vacuum comprising said negative air pressure substantially throughout said conduit, said negative air pressure causing said ice to traverse said conduit from said source into said receptor; [emphasis by Examiner]

The Examiner then refers to Berge et al. (U.S. Patent No. 5,660,506) for an alleged teaching that "frozen food such as chopped vegetables or diced meat, ice cubes or crushed ice are functional equivalents of each other."

However, the Examiner's reliance upon Benny does not support a § 102(b) anticipation rejection of any of Appellants' claims.

1. Lack of Anticipation - Different Structure and Method

The Examiner has misread Benny. Benny does not identically disclose Appellants' apparatus or method, as is required for anticipation.

> Invalidity for anticipation requires that all of the elements and limitations of the claim are found within a single prior art reference. *Carella v. Starlight Archery and Pro Line Co.*, 804 F.2d 135, 138, 231 U.S.P.Q. 644, 646 (Fed. Cir., 1986); *RCA Corp. v. Applied Digital Data Systems, Inc.*, 730 F.2d 1440, 1444, 221 U.S.P.Q. 385, 388 (Fed. Cir., 1984). There must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention.
>
> *Scripps Clinic & Research Foundation v. Genentech Inc.*, 927 F.2d 1565, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir., 1991).

Significant differences exist between the structure and its operation disclosed by Benny and that claimed by Appellants.

Benny discloses a partial vacuum system for pulling fish, typically salmon, out of a docked fishing boat hold and moving them in a dockside fish processing facility (Figure1; col. 2, lines 34-36) or for moving potatoes from a truck to a conveyer belt (Figure 12; col. 7, lines 18-32). Benny's system uses a vacuum pneumatic conveying apparatus to create a vacuum air flow in which the "food product" (i.e., a fish or potato) is entrained and travels to a "designated locale" at which the "air flow is expanded and changed in direction, while the food product continues direct on." (Col. 1, lines 44-50). More specifically, Benny's system draws the fish or potatoes up a short inclined or stepped riser (Figure 1, #44; Figure 12, #210) to a separating chamber (Figure 1, #54; Figure 12, #214) by use of air flow in the riser created by a vacuum "blower" (Figures 1 and 12, #32). *Upon reaching the separator 54/214 the vacuum is broken*, the air flow is diverted from the food travel path, and *the fish or potatoes continue on by gravity alone* through elongated downwardly inclined conduits (Figure 1, ##88, 96, 99); Figure 12, #216) to a fish processing conveyor (Figure 1, #26) or a potato conveyor (Figure 12, below #190). In the separator debris and waste material (Figure 1, #158; Figure 12, #222) also separate from the food and are directed downwardly within the separator into a weight-activated discharge sleeve (Figures 1 and 12, #160).

The Examiner has attempted to read Appellants' claimed system onto the Benny disclosure by equating elements of Benny with what the Examiner contends are the same elements in Appellants' structure. However, the Examiner has completely ignored the actual function and operation of the Benny structure in making such a comparison. One skilled in the art would immediately recognize that the Examiner is not comparing like with like.

It is established that a rote recitation of an element from a reference does not establish anticipation under § 102(b) if the element recited cannot perform the function and meet the structure of the claimed invention.

> Anticipation is determined by comparison of the reference with the claims. ... The limitations which must be met by an anticipatory reference are those set forth in each statement of function. ... Such a limitation cannot be met by an element in a reference that performs a different function, even though it may be part of a device embodying the same general overall concept. *RCA Corp. v. Applied Digital Data Systems, Inc.*, 730 F.2d 1440, 221 USPQ 385 (Fed. Cir., 1984). See also *In re Mott*, 557 F.2d 266, 269, 194 USPQ 305, 307 (C.C.P.A., 1977).
>
> While ... the same words ... [may be used] ... to describe both the [claimed invention] and the [prior art], it is apparent that they are being used in different ways to connote different intended functions. The [prior art] cannot anticipate the [claimed invention] simply by possessing identically named parts, unless these parts also have the same structure or otherwise satisfy the claim limitations, and were understood to function in the same way by one skilled in the art.
>
> *Applied Medical Resources Corp. v. United States Surgical Corp.*, 147 F.3d 1374, 47 U.S.P.Q.2d 1289, 1293 (Fed. Cir., 1998).

The Benny system is intended to convey large, non-fragile food items (namely fish and potatoes) in very harsh environments, over very short distances, and under conditions where some damage to the food product is not only tolerated but in fact expected. Whole salmon and potatoes are not ice cubes, and no one skilled in the art would consider conveyance methods and devices useful for fish and potatoes to be related to or analogous to methods and devices for conveying ice cubes.

The Examiner attempts to avoid this self-evident observation by referring to Berge's comment about conveyance of some frozen foods. However, the Berge statement is directly contrary to the Benny disclosure, since Berge expressly states that he is referring to small diced metal and vegetable pieces as being equivalent in size and shape. Berge cannot in any manner be read as equating large potatoes or even larger salmon with small ice cubes, and Benny's system is irrelevant to small diced meats or vegetables.

Further, Appellants' claims are to a system solely involving ice conveyance and avoiding the problems raised by ice's fragility. Therefore even Berge's disclosure is not relevant, since neither diced meat nor vegetable pieces are particularly fragile.

Second, Benny's system is clearly not a system identical to Appellants' claimed system. All of Appellants' claims (being based on Claims 1 and 126) require that there be vacuum motivation of the ice *substantially throughout* the entire conveyance route within the conduits. The Examiner has recognized that, having emphasized the words in Appellants' amended claims. Benny, however, does *not* have motivating vacuum *throughout* his system. Indeed vacuum exists *only* in the short initial riser section to pull the fish or potatoes upward to the vacuum separator. At the vacuum separator *the vacuum is broken* and the air flow created by the vacuum blower diverted into the separator and away from ongoing the fish/potato travel path. The fish and potatoes then travel on through the downwardly directed elongated conduit 88 and 216 *entirely by gravity* (Benny, col. 5, lines 41-42).

It might be contended that the effects of Benny's vacuum blower 32 are felt in the downstream conduit 88/216 and that a vacuum also exists in that conduit. It may be that a slightly reduced air pressure could be present in that conduit, but Benny does not disclose that. Even if that were the case, it is *not* a vacuum sufficient to have any *motivating* effect on the food, since Benny specifically states that the sole motivation past the separator is by gravity.[3]

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[3] In the amendments to Claims 1 and 126 submitted in Papers Nos. 16 and 17, Appellants offered language which would further emphasize this distinction between Benny's partial vacuum motivation and Appellants' all-vacuum motivation by precluding long, non-vacuum system portions equivalent to Benny's extended gravity-motivated conduits 88 and 216. See Appendix B hereto. Those amendments were not accepted by the Examiner.

Third, Benny requires that the effective source of the motivating vacuum air flow be at the apex of the system, which is the only way that the gravitationally motivated exit of the fish or potatoes from the system can be effected. Thus while Benny may place the blower 32 at a low level, the vacuum developed by the blower can only be imposed on the food path conduit at the very top (at #50) of the separator, and the highest point of the system, as is evident from Benny's Figures 1 and 12. Those skilled in the art would clearly understand that in the absence of this "A-shaped" configuration, Benny's system is inoperative. Neither fish, nor potatoes, nor ice, can move *upward* by gravity. In Appellants' claimed system, however, since the motivating vacuum is imposed at or adjacent to the terminus of a conduit and is present throughout the entire length of each conduit, there is no limit on the configuration of the system, and conduits can be run upwardly, downwardly or laterally, as is evident from Appellants' figures, particularly Figures 13, 15, 16 and 35.

Since Benny's structure is different from that claimed in Claim 1, the rejection of Claim 1 as anticipated by Benny has no merit and should be reversed.

2. Reliance on Berge Precludes an Anticipation Rejection:

The Examiner's reliance upon Berge also negates the § 102(b) rejection. The Examiner cleverly avoids citing Berge as part of the basis of the rejection when he states that the claims are rejected under § 102(b) over Benny. In fact, however, the rejection cannot stand on Benny alone, since Benny does not teach an *ice* conveyance system. Therefore the Examiner must resort to Berge, but does so in the improper guise of extrinsic evidence, which is not permitted to support this rejection.

> The role of extrinsic evidence is to educate the decision-maker to what the reference meant to persons of ordinary skill in the field of the invention, not to fill gaps in the reference; *Studiengesellschaft Kohle, m.b.H. v. Dart Industries, Inc.*, 726 F.2d 724, 220 U.S.P.Q. 841 (Fed. Cir. : 1984). ... If it is necessary to reach beyond the boundaries of a single reference to provide missing disclosure of the claimed invention, the proper ground is not §102 anticipation, but §103 obviousness.
>
> *Scripps Clinic & Research Foundation, supra*, 927 F.2d 1565, 18 USPQ2d 1001, 1010.

Since Berge is necessary to fill in a crucial gap in Benny -- the relevance of Benny to conveyance of *ice* -- a § 102(b) rejection on Benny alone cannot stand.

3. Examiner's Interpretation of Benny is not that of Person Skilled in the Art:

The interpretation of Benny used by the Examiner is contrary to what would be understood from Benny by a person skilled in the art. It is not necessary here to consider extrinsic evidence to explain the disclosure of a [§ 102(b)] reference, *see Scripps Clinic & Research Foundation*, *supra*, 927 F.2d 1565, 18 USPQ2d 1001, 1010, since the Benny reference itself makes clear that the person skilled in the art would not interpret the reference in the manner used by the Examiner.

When a patent is cited as anticipation of a claimed invention, it must describe the subject matter in a manner in which those skilled in the art would recognize the disclosure as an anticipation. "For a publication to constitute an anticipation of an invention and, thus, to bar the grant of a patent under 35 U.S.C. 102, it must be capable, when taken in conjunction with the knowledge of those skilled in the art to which it pertains, of placing that invention in the possession of the public." (*In re Donohue*, 632 F.2d 123, 207 U.S.P.Q. 196, 199 (C.C.P.A., 1980), *citing In re LeGrice*, 301 F.2d 929, 944, 133 U.S.P.Q. 365, 378 (C.C.P.A., 1962) and *In re Brown*, 329 F.2d 1006, 1011, 141 U.S.P.Q. 245, 249 (C.C.P.A.,1964) See also *Studiengesellschaft Kohle, m.b.H. v. Dart Industries, Inc.*, cited *supra*, page 11, in the quote from the *Scripps Clinic* case.

It is evident that Benny's disclosure and system fail to correspondence to or teach Appellants' claimed invention in several critical particulars, all of which would be taken by those skilled in the art to clearly distinguish the two systems.

The Examiner's reading of Benny, in which he either minimizes the presence of the extensive gravity conduits 88/216 or tries to treat them as part of the vacuum motivation portion of Benny's disclosed system, is directly contrary to how Benny would be interpreted by those skilled in the art. To reach his rejection as he defines it by his insertion of Benny's numerals into Appellants' claims (see the example of Claim 1 above), the Examiner must completely ignore the plain and simple engineering and physics necessarily inherent in the

system described and pictured by Benny. He must also ignore Benny's express wording which states unequivocally that the motivating vacuum is present only in the initial upwardly directed portion of this much larger system. He must further reach to a non-cited, non-analogous reference, Berge, for a contention that moving meats and vegetables equates to moving ice, and even then he must ignore Berge's limitation to small diced pieces of meat and vegetables and contend that Berge's statement can be extended to equating heavy potatoes and even heavier salmon[4] with small, light ice cubes. Such extensions upon extensions take the Examiner to an unreasonable conclusion that would never be reached by one skilled in the art of ice conveyance.

Since the Examiner can read Benny's structure on Appellants' structure defined in Claim 1 only by adopting an interpretation of Benny which is different from that which would be understood by those skilled in the art, the rejection of Claim 1 as anticipated by Benny has no merit and should be reversed.

4. Benny's Disclosures as to Claims 11 and 39 are merely Incidental:

The Examiner also included Claims 11, 39 and 126 in the rejection under § 102(b) over Benny. The arguments above apply equally to Claims 11 and 39. As to Claim 11, the Examiner contends that the fish processing conveyers 26 are the equivalent of Appellants' accumulators and that Benny's discharge sleeve 106 is equivalent to Appellants' accumulator doors. Such equivalences are not relevant for the purposes of § 102(b), since the limitations of Claim 11 must be read as part of the overall system of Claim 1 from which it depends. Since the Benny system as a whole is entirely different from Appellants' system, the fact that some individual elements of Benny's system might have a function similar to elements of Appellant's system does not create anticipation under § 102(b).

Similarly, the Examiner contends that the connection structure that allows Appellants' ice to traverse the final short distance from the end of the conduit to the receptor after allowing for the space needed for the vacuum line connection (illustrated, for

[4] It is well known that adult salmon commonly weigh six pounds or more.

instance, in Appellants' Figures 5 and 35) is the equivalent of Benny's gravity discharge conduit 88/216. The discussion above clearly refutes this contention, since the short final distance over which Appellants' ice cubes move by their momentum after exiting from the vacuum system conduit is entirely dissimilar in extent and operation from Benny's extended conduit through in which the fish or potatoes fall by gravity. Even if there were considered to be some marginal equivalence, as discussed above for Claim 11, the fact that some individual elements of Benny's system might have a function similar to elements of Appellant's system does not create anticipation under § 102(b).

Since the structures claimed in Claims 11 and 39 are claimed as dependent from the structure of Appellants' Claim 1, and since Benny's structure is different from that claimed in Claim 1, the mere inclusion of individual elements similar to elements in the Benny structure does not make Claims 11 and 39 anticipated by Benny, so their anticipation rejection has no merit and should be reversed.

5. Benny's Structure cannot Anticipate Appellants' Method Claim 126:

The Examiner's § 102(b) rejection of Claim 126, a method claim, appears to be simply a repeat of his rejection of Claim 1, an apparatus claim. In the Office Action there is no insertion of Berry's numerals to show any alleged equivalence of method steps. The Examiner's only comment was "See Claim 1, above" which Appellants interpret to mean that the indicated alleged equivalences set forth by the Examiner are intended by him to be also the basis for the § 102(b) rejection of Claim 126. That being the case, Appellants submit that all of the arguments presented above against Benny as the basis of a § 102(b) rejection are equally applicable here, notwithstanding that Claim 1 is an apparatus claim and Claim 126 is a method claim.

Appellants therefore submit that their arguments above that Benny does not anticipate Appellants' apparatus claimed in Claim 1 are fully applicable to the method claimed in Claim 126.

It will also be evident that one skilled in the art would immediately recognize that since Benny's system is only a partial vacuum system, and relies upon non-vacuum gravity

motivation for transport of food products over a substantial portion of the system, it is applicable only to movement of heavy, high momentum foods, such as the fish and potatoes which are the only foods disclosed by Benny. A system relying to such a substantial degree on gravity motivation cannot function with light weight, low momentum objects such as ice cubes. Ice cubes cannot travel under gravity for the extended distances that Benny's system discloses for fish and potatoes, since light weight ice cubes cannot acquire sufficient momentum to traverse extended distances. This necessarily means that in the Benny system ice will stop within the long exit conduit and that the accumulated stopped cubes will clog the conduit and halt the operation. Therefore Benny's disclosure cannot anticipate Appellants' method Claim 126, since a method based on Benny's disclosure as applied to ice would be inoperable.

Appellants acknowledge that their system, with vacuum motivation throughout the conduits, does rely on gravity and ice cube momentum for discharge from the conduit into the receptor, as illustrated, for example, in Figures 4, 5 and 35. Such reliance, however, is minimal, usually being movement over just a few inches, and most often being simply free-fall of the ice from the end of an accumulator or conduit (see, for instance, the B portions of Figures 7-12 and Figures 4 and 23). Such action does not change the fundamental all-vacuum transport nature of Appellants' claimed system and method, and change it into a Benny-like system or method in which vacuum is used only for initial movement to an elevated point and gravity is relied upon for all subsequent movement.

It will also be evident that nothing in Claim 126 requires use of vacuum to raise the ice to an elevated point, as is required for the method of food transport disclosed by Benny., and without which Benny's method of operation cannot function. Indeed nothing in Claim 126 mentions any configuration of the system at all, other than use of a negative pressure conduit to move the ice from the source to the receptor. Appellants' method can be conducted with a completely horizontal conduit or with a conduit (or network of conduits) in any combination of level, upward or downward stretches.

For all of these reasons, It is clear that Claim 126 is not anticipated by Benny under § 102(b).

Since the mixed vacuum-gravity method disclosed by Benny's (i.e., the operation of his system) is different from the all-vacuum method claimed in Appellants' Claim 126, and since the attempted operation of Benny's system with ice would result in inoperability of Benny's system, the rejection of the method of Claim 126 as anticipated by Benny has no merit and should be reversed.

In summary, therefore, the § 102(b) rejection over Benny as to any of Claims 1, 11, 39 and/or 126 (and by extension, any of the claims dependent therefrom) cannot be sustained and should be reversed.

B. Obviousness over Benny in view of Wade or Pink; Claims 59, 65, 72, 97, 102, 105, 128, 138, 145, 151 and 164

The arguments made above for the § 102(b) rejections of Claims 1 and 126 based on Benny are equally applicable when applied to Benny as the basis of § 103(a) obviousness rejections of the apparatus Claims 59, 72, 97, 102 and 105 and the method Claims 128, 138, 145 and 164 by combination of Benny with the secondary references Wade or Pink. Appellants incorporate those arguments herein by reference, and will concentrate in this section on those aspects which are specific to § 103(a) rejections.

It will be evident that the Benny disclosure does not provide any teaching from which one skilled in the art would be motivated to combine Benny with the secondary references to support an obviousness rejection under § 103(a), or any teach that such a combination, if made, would result in any disclosure from which Appellants' claimed apparatus or method would be obvious to that person skilled in the art. A mixed motivation system in which a large portion of the system is gravity-motivated, not vacuum-motivated, cannot make an all-vacuum obvious to one skilled in the art within the meaning of § 103(a).

Benny in fact teaches essentially the opposite of Appellants' system. Benny's system requires the location of the vacuum source at the high point of his structure, located midway between the fish boat or potato truck at one end and the fish processing plant or

potato conveyor belt at the other end. One skilled in the art would immediately recognize that an all-vacuum system based on Benny *would draw the fish or potatoes from both ends into the middle!*

In order to make a Benny-based all-vacuum system work, the person skilled in the art would first have to disregard the entire Benny disclosure related to the structure and operation of the gravity-motivation portion of his system. This would effectively eliminate the entire fish- or potato-delivery portion of the Benny system after separation of the fish or potatoes from the accompanying debris, and literally leave the fish or potatoes in mid-air to drop to the dock or ground from the outlet of the separator 54/214. Clearly the substantial and elongated gravity portion of the Benny system is essential to operation of that system, and would be so recognized by those skilled in the art. It is well established that an obviousness rejection cannot be sustained when to make the claims invention would require wholesale and fundamental changes in the disclosed system of the reference. One cannot modify the prior art system to find obviousness when such when the modification will render the prior art reference inoperable for its intended purpose; *In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir., 1984).

Similarly, even though the Examiner contends that the gravity-motivation section of the Benny system could have a reduced air pressure within it, and thus implies that it could suggest a modification of the Benny's gravity-motivated portion to teach Appellants' all-vacuum-motivated system, such speculation and interpretation cannot be used as part of the basis for a § 103(a) rejection. Nothing in the prior art suggests any such modification or the desirability of such modification; *In re Gordon et al.*, *supra*, and Benny's disclosure in fact makes such modification impossible. It will be noted, as mentioned above, that not only does Benny not discuss reduced pressure or vacuum motivation within the downstream segment of his system, but he specifies that the motivation in that segment must be by gravity. One cannot use a reference as basis for a § 103(a) rejection when the reference itself teaches directly to the contrary, or when the modification would be destructive of the referenced system, so that Benny cannot be used in any combination with the secondary references.

> There is no suggestion to combine, however, if a reference teaches away from its combination with another source. *See In re Fine*, 837 F.2d 1071, 1075, 5 U.S.P.Q.2d 1596, 1599 (Fed. Cir., 1988): "A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant . . . [or] if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant." *In re Gurley*, 27 F.3d 551, 553, 31 U.S.P.Q.2d 1130, 1131 (Fed. Cir., 1994). If when combined, the references "would produce a seemingly inoperative device," then they teach away from their combination. *In re Sponnoble*, 405 F.2d 578, 587, 160 U.S.P.Q. 237, 244 (C.C.P.A., 1969); *see also In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) (finding no suggestion to modify a prior art device where the modification would render the device inoperable for its intended purpose).
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> *Tec Air Inc. v. Denso Manufacturing Michigan Inc.*, 192 F.3d 1353, 52 U.S.P.Q.2d 1294, 1298 (Fed. Cir., 1999)

1. The Benny/Wade Combination:

The Examiner specifies Claims 59, 72, 97, 102 and 105 (apparatus) and 128, 138, 145 and 164 (method) as being obvious over Benny in view of Wade, and acknowledges that the combination is necessary since Benny does not disclose the subject matters of those claims. To the extent that the Examiner's insertion of Benny numerals into portions of those claims can be understood as a statement of the grounds of rejection, Appellants submit that, since all of the cited claims are dependent from either Claim 1 or Claim 126, and since Benny is not a sufficient basis for an obviousness rejection of the independent claims, neither is it sufficient basis for an obviousness rejection of the cited dependent claims.

Addition of Wade for the cited claims does not overcome the fatal deficiencies of Benny. All of the claims cited are directed to specific details of Appellants' apparatus or method as defined in Claims 1 or 126. The mere fact that some elements or steps of Appellants' apparatus or method may be the same or, or have a similarity to, or be called by the same name as, some elements or steps in Wade's disclosure, does not rise to the level of teaching one skilled in the art to combine those elements or steps into Benny's

substantially different system under § 103(a). As discussed above in the quotation from the *Tec Air* case, there must be motivation to make such a combination from the prior art, such combination must not destroy one of the other of the references for its intended purpose, and the end result of the combination must teach Appellants' claimed apparatus and method. None of those requirements is met here.

First, Wade's mere showing of a receptor (Claim 59), a sensor (Claims 72 and 145), introducing a cleaner (Claim 97), an air lock (Claim 102), flexible discharge tubing (claim 105), using an openable receptor gate (Claim 128), defining the location of the vacuum connection (Claim 138) or having a plurality of receptors (Claim 164), does not lead to a viable combination with Benny. Wade's elements and steps are commonplace in many transport systems. However, placing them in Benny's system does not convert Benny's mixed vacuum-gravity system into Appellants' all-vacuum system in a manner sufficient to meet the requirements of § 103(a).

In addition, several of the Wade elements and steps have no function in Benny's system, adding to the lack of teaching of combination to those skilled in the art. These include the sensor (Benny has no need to "sense" how many fish or potatoes reach the fish or potato conveyers), the cleaner (such "cleaning" as is necessary for Benny's raw fish or potatoes occurs in the debris separator), the air lock and the definition of the vacuum connection (Benny's system requires that it be at the separator).

The Examiner tries to meet the "motivation" requirement by claiming that "Benny et al. and Wade et al are analogous art because they concern the movement of ice particles entrained in air from a source to an accumulation point" and "The suggestion/motivation for [combining Benny and Wade] would have been to transport ice particles from disparate remote ice-making sources to disparate remote storage locations" (Office Action, page 8, last paragraph, and page 9, second paragraph). Those are absolutely incorrect statements. Nothing in Benny involves ice transport in the least. (Any small amount of ice which may get sucked out of the fish boat hold along with the fish by Benny's upstream vacuum line is purely incidental to the fish transport and in any case such ice will be filthy, so Benny separates and discards it in the separator. Benny certainly cannot be considered

teaching of transporting ice for human consumption.) Appellants have extensively discussed above the non-analogy between ice transport and fish/potato transport. Those statements completely refute the Examiner's contention of analogy of Benny and Wade based on ice transport.

Finally, the last requirement is not met, because even if one did try to integrate Wade's ice system elements and steps into Benny's fish/potato transport system, one or the other would be destroyed for its intended purpose. Appellants have extensively discussed above how the structures and operations necessary for delivery of intact fragile clean ice for human consumption differ entirely from the structures and operations necessary to move dirty, raw fish and potatoes for processing. One skilled in the art would be immediately aware that Wade and Benny cannot be combined unless one or both is subject to wholesale revision.

It is therefore evident that the § 103(a) combination rejection of obviousness of Claims 59, 72, 97, 102, 105, 128, 138, 145 and 164 over Benny in view of Wade is without merit and should be reversed.

2. The Benny/Pink Combination:

Substantially the same contentions and alleged motivations are set forth by the Examiner in the rejection of Claims 65 and 151.[5] The Examiner cites Pink as showing a means of unbridging joined ice cubes, and states that it would have been obvious to use Pink' unbridger in Benny's system. Appellants are unable to discern any reasonable basis for the Examiner's statement. Benny does not mention, use, handle, process or transport bridged ice cubes which might need unbridging (or indeed any ice cubes at all).

The Examiner contends that motivation involves transport of ice (refuted above with Wade) and for maintaining "the ice particles at a certain size." This statement makes no sense. There is no ice use in Benny associated with the potatoes, and any ice which might

[5] At one point in this rejection the Examiner appears to include Claim 97. Since Claim 97 does not deal with unbridging ice, Appellants assume that mention of Claim 97 was an inadvertent error by the Examiner. However, should the Examiner have in fact meant to include Claim 97, it is requested that the grounds of a § 103(a) rejection of Claim 97 be more definitely stated and explained by the Examiner so that Appellants can address those in any Reply Brief.

be in the fishing boat's fish holding tank was put into the tank water as large blocks to keep the fish cold until they reach the dock. There is absolutely no thought by any one skilled in the art of transport of consumable, or deep sea fishing, or fish processing, who would have any thought whatsoever that the filthy ice blocks that slosh around in a fishing boat's hold for weeks at sea should for some reason be "maintained at a certain size."

In short, the combination of Benny and Wade, as stated by the Examiner, has no basis that would be recognized by anyone skilled in the art.

It is therefore evident that the § 103(a) combination rejection of obviousness of Claims 65 and 151 over Benny in view of Pink is without merit and should be reversed.

In summary, therefore, the § 103(a) rejection over Benny as to any of Claims 59, 65, 72, 97, 102, 105, 128, 138, 145, 151 and/or 164 (and by extension, any of the claims dependent therefrom) cannot be sustained and should be reversed.

C. Reinsertion of the Non-elected Claims

As noted in the "Status of Claims" section, 149 of the 164 claims in this application were withdrawn by the Examiner on the grounds that Appellants' claim structure was unduly multiplied and prolix, based on 35 U.S.C. § 112, ¶ 2, in view of 37 C.F.R. § 1.75(b). In support of that withdrawal the Examiner cited certain claims that recited alternative embodiments of elements or steps of Appellants' apparatus or method, and questioned why such alternative claims were needed. More recently, during a telephone conversation between the Examiner and Appellants' attorney following the final rejection of the elected claims, the Examiner denied the attorney's request to reinstate those 149 for this appeal.

Appellants submit that the Examiner's citation of § 112, ¶ 2, in withdrawal of those claims and his subsequent refusal to reinstate the claims for the purpose of appeal constitutes a rejection of those claims under § 112, ¶ 2, which is reviewable on this appeal. Appellants therefore submit that Claims 1-164 are not unduly multiplied, that there is no prolixity, that the claims cited by the Examiner are entirely proper as defining alternative

embodiments of the claimed invention, and that the rejection should be reversed and the non-elected claims reinstated in the case and allowed as being dependent from allowable Claims1 or 126.

It is well settled that an applicant is entitled to define his or her own claim structure, and that that claim structure must be accepted by the Examiner unless the claims are unduly multiplied (§ 1.75(b)) or the prior art indicates that some of all of the claims are unpatentable; In re *Flint*, 411 F.2d 1353, 162 U.S.P.Q. 228 (C.C.P.A., 1969); *In re Chandler*, 319 F.2d 211, 138 USPQ 138, 148 (C.C.P.A., 1963). As to the prior art, Appellants have clearly established above that Claims 1 and 126, and by extension all claims dependent therefrom, are patentable over the prior art.

Therefore the sole ground remaining is that of alleged undue multiplicity or prolixity. "Undue multiplicity" (which is the only term used in § 1.75(b)) means too many claims. The dictionary definition of "prolix" is "excessive length," by which the Examiner presumably meant that the claim structure is too long, which is synonymous with undue multiplicity. Appellants strongly take issue with that interpretation and the resulting rejection.

A reading of this application makes clear a) that the invention claimed -- an all-vacuum ice conveyance system -- is a unique and pioneering system and therefore entitled to broad protection, and b) that the system has a large number of reasonable embodiments and variations, which are fully described in the Specification and illustrated in the claims (per 35 U.S.C. § 113). *At no time has the Examiner challenged the overall scope of the invention.* Indeed, even at the outset, the Examiner only called for reducing the number of claims under examination to fifteen not because of the scope of the invention, but rather to simplify the examination of the overall invention. Appellants were requested to, and did, select the claims for examination on the basis of providing representative claims for all aspects of the invention (note the actual numbers of the claims selected), so that the Examiner could examine all aspects of the invention together but through the vehicle of a simplified claim structure. In fact the Examiner and Appellants' attorney engaged in a short exchange of correspondence (Papers 4-9) regarding the exact selection of claims in order to fairly represent the broad overall scope of the invention, and once that was settled

the Examiner proceeded to examiner the entire invention.

In furtherance of this, the Appellants indicated that they would accept that examination as applicable to all claims, elected and non-elected. Appellants have adhered to that position, as is evident from the arguments made herein against the § 102(b) and § 103(a) rejections of the elected claims. The Examiner has therefore been spared any undue exertion to examine the case, The Examiner has not at any time indicated that the search has been unduly burdensome, and in fact the Examiner's change of grounds of prior art rejection from primarily Wade to primarily the not-previously cited Benny indicates that not only was the Examiner not burdened, he found it quite reasonable to expand his examination and cite new art.

No ground exists for the Examiner's refusal to reinstate the non-elected claims for inclusion in this appeal. It is unreasonable for the Examiner to examine fifteen independent claims, which he has acknowledged to define a broad invention, and then to deny inclusion of *any* of the related dependent claims in the case. Clearly 15 independent claims can support 149 dependent claims. since that is only a 1:10 ratio, which is common in many cases (e.g., it is essentially equivalent to two independent claims and 20 total claims).

In contending that there is undue multiplicity, the Examiner has cited only an instance of three similar claims being focused on related diverter embodiments of the invention. Appellants disagree with the Examiner's identification as "multiplicity," but even if one accepts that, an isolated instance out of many otherwise unchallenged claims does not justify the Examiner's refusal to include *any* of the dependent claims. *When an applicant has a broad invention, and fully describes in it the Specification and drawings, the applicant is entitled to have an extensive claim structure commensurate with the broad scope of the invention.* If the Examiner wishes to single out some such alleged multiple set of claims, he may do so, but he must reinstate *all of the other* dependent claims. To refuse to do so is unfair and highly detrimental to Appellants, and improperly restricts their ability to obtain a patent on their invention in its entirety; *Chandler, supra*; *Ex parte Primich*, 151 U.S.P.Q. 737 (Bd.Pat.App.&Int., 1966); Horowitz, PATENT OFFICE RULES AND PRACTICE, vol. 1, § 75.8, pp. 5-90 to 5-93 (2001).

For these reasons, Appellants submit that the de facto rejection of Claims 2-10, 12-38, 40-58, 60-65, 66-71, 73-96, 98-101, 103-104, 106-127, 129-137, 139-144, 146-150 and 152-163 under 35 U.S.C. § 112, ¶ 2, under the guise of "withdrawal" is without merit and should be reversed. Further, Appellants submit that in view of the remarks throughout this Brief, it is clear that these claims, being dependent from allowable claims, are also themselves allowable, and therefore reinstatement of these claims into this case, and allowance thereof, is fully warranted and is requested by Appellants.

APPENDICES

Appendix A sets forth the appealed claims, double spaced as required, with Claims 1 and 126 being presented in their unamended forms in effect at the final rejection of November 1, 2001. [Appendix pages 1-6]

Appendix B sets forth the amended forms of Claims 1 and 126, according to the amendments submitted in Papers Nos. 15 and 16, double spaced as required. Entry of these amendments has been denied. [Appendix pages 7-8]

Appendix C sets forth all of the claims, elected/appealed and non-elected, with the elected/appealed claims shown in italic type for ease of identification. Claims 1 and 126 are shown in their non-amended form. [Appendix pages 9-49]

FEE; ORAL HEARING NOT REQUESTED

This Appeal Brief is filed in triplicate, as required by 37 C.F.R. § 1.192.

An oral hearing is not requested.

A check in the amount of $320.00 for the filing of this appeal brief, as required by 37 C.F.R. § 1.17(c), is enclosed herewith. Should any other fees be require in conjunction herewith, the PTO is authorized to charge such additional fee, or credit any refund, fee to Deposit Account No. 02-4070.

CONCLUSION

In view of the above, Appellants respectfully submit that it has been shown that the Examiner's 35 U.S.C. §§ 102(b) and 103(a) rejections of the appealed claims are without merit in fact or in law. This Honorable Board is therefore respectfully requested to ***reverse*** the Examiner's rejections of Appellants' Claims 1, 11, 39, 59, 65, 72, 97, 102, 105, 126, 128, 138, 145, 151 and 164.

In addition, since all of the non-elected claims are dependent directly or indirectly from the thus-allowed appealed claims, and since Appellants have demonstrated that no ground exists for considering the entire claim structure to be unduly multiplied or prolix, this Honorable Board is also requested to rescind the Examiner's withdrawal of those claims, return those claims to the application, reverse the Examiner's multiplicity/prolixity rejection and hold those claims to be also allowable.

Following such rulings, remand of the application to the Examiner with instructions to allow all Claims 1-164, all claims properly in the case, is requested.

INVITATION

Should there be any questions with respect to this Brief on Appeal or should the Examiner believe that resolution of any issues might be achieved by further discussion of such issues or possible further amendment to the application, the Examiner is cordially invited to telephone the undersigned Attorney for Appellant, collect, at the San Diego, California, telephone number listed below.

Date: April 24, 2002

Respectfully Submitted,

By: _____

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APPENDIX A

CLAIMS ON APPEAL

1. Apparatus for conveying ice in the form of a plurality of pieces each having physical characteristics amenable to transport by negative air pressure pneumatic conveyance, from a source of said ice to a remote location under said negative air pressure, which comprises:

a hollow elongated ice conduit connecting said source of ice and said remote location and providing ice communication therebetween;

a receptor at said remote location for receiving said ice; and

a vacuum pump in fluid communication through a vacuum line with said receptor for withdrawing air from said conduit and creating a vacuum comprising said negative air pressure substantially therethrough said conduit, said negative air pressure causing said ice to traverse said conduit from said source into said receptor.

11. Apparatus as in Claim 1 wherein said receptor at said remote location comprises an accumulator having therein an openable gate for release therefrom at said remote location of accumulated pieces of ice conveyed thereto from said source.

39. Apparatus as in Claim 1 or 11 further comprising said vacuum line connecting in fluid communication into said hollow conduit at a first point of connection upstream of a second point of connection of said hollow conduit into said receptor, and spaced apart from said second point of connection by an interval not greater than a distance that said ice pieces can traverse under momentum imparted to them by their prior conveyance by said negative air pressure, such that diversion of at least a portion of conveying force of said negative air pressure at said first point of connection does not prevent said ice pieces from continuing to traverse entirely through said hollow conduit and into said receptor.

59. Apparatus as in Claim 11 further comprising said receptor being disposed adjacent to an inlet of a subsequent conduit leading to a subsequent accumulator at another remote location, and said pieces of ice released from said receptor being deposited into said inlet for conveyance through said subsequent conduit to said subsequent accumulator at said another remote location.

65. Apparatus as in Claim 1 or 11 further comprising a collector into which ice pieces delivered from said source of ice are received, said collector having a first opening into said first conduit, and further comprising unbridging means associated with said collector for presenting said released ice pieces individually and unbridged to said first opening, whereby said ice pieces pass through said first opening into said first conduit.

72. Apparatus as in Claim 1 or 11 further comprising sensor means for detecting the presence or absence of ice in said receptor.

97. Apparatus as in Claim 1 or 11 further comprising cleaner introducing means for introducing a liquid cleaner into said ice conduit and conveying said liquid cleaner through said ice conduit under said negative air pressure, whereby passage of said cleaner through said ice conduit cleans contaminants from the interior of said conduit, and upon discharge of said cleaner at an outlet of said conduit, removes from said conduit said contaminants entrained in said cleaner.

102. Apparatus as in Claim 1 wherein said receptor at said remote location comprises an air lock device which is connected to said ice conduit on an upstream side and which has an inlet for pressurized air from a source thereof on a downstream side and another conduit extending from said downstream side for passage of said pressurized air, such that ice entering said air lock device from said ice conduit passes through said air lock device and is propelled through said another conduit at high velocity by said pressurized air.

105. Apparatus as in Claim 102 wherein that portion of said another conduit downstream of said air lock comprises flexible tubing with an outlet at an end distal from said air lock device and further comprising directing means for manual, mechanical, pneumatic or electrical positioning of said outlet of said flexible tubing.

126. A process for conveying ice in the form of a plurality of pieces each having physical characteristics amenable to transport by negative air pressure pneumatic conveyance, from a source of said ice to a remote location under said negative air pressure, which comprises:

a. providing a hollow elongated ice conduit connecting said source of ice and said remote location and providing ice communication therebetween; a receptor at said remote location for receiving said ice; and a vacuum pump in fluid communication through a vacuum line with said receptor for withdrawing air from said conduit and creating a vacuum comprising said negative air pressure substantially throughout said conduit, said negative air pressure causing said ice to traverse said conduit from said source into said receptor;

b. withdrawing air from said receptor and conduit and creating a vacuum comprising said negative air pressure in said receptor and conduit; and

c. causing said ice to traverse said conduit from said source into said receptor under the influence of said negative air pressure.

128. A process as in Claim 126 where said receptor comprises an accumulator, said process further comprising

a. providing an openable gate in said accumulator at said remote location;

b. causing pieces of ice conveyed into said accumulator through said conduit by said vacuum to come to rest bearing upon said gate, said gate being biased

against opening; and

c. releasing of accumulated pieces of ice conveyed from said source from said accumulator at said remote location by counteracting or eliminating such biasing.

138. A process as in Claim 126 further comprising

a. connecting said vacuum line in fluid communication into said ice conduit at a first point of connection upstream of a second point of connection of said ice conduit into said receptor, and spaced apart from said second point of connection by an interval not greater than a distance that said ice pieces can traverse under momentum imparted to them by their prior conveyance through said conduit by said negative air pressure; and

b. conveying said ice pieces under that amount of force of said negative air pressure at said first point of connection sufficient to cause said ice pieces to continue to traverse entirely through said first conduit and into said receptor without diversion of any ice pieces into said first vacuum line.

145. A process as in Claim 126 wherein said receptor comprises an ice dispenser and further comprising detecting the presence of ice in said ice dispenser.

151. A process as in Claim 126 further comprising receiving ice pieces delivered from said source of ice in at least partially bridged condition, and unbridging said ice pieces prior to delivering said ice piece into said ice conduit.

164. Apparatus as in Claim 1 or 11 comprising a plurality of said receptors or said ice sources and said conduit having an intermediate division point from which a plurality of branch conduits extend, each branch conduit leading directly or through at least one intermediate further division point from which a subsequent plurality of further branch conduits extend, to an ice communication connection with a respective one of said plurality of receptors or ice sources.

APPENDIX B

CLAIMS 1 AND 126 AS PROPOSED TO BE AMENDED

(From Papers 16 and 17)

1. Apparatus for conveying ice in the form of a plurality of pieces each having physical characteristics amenable to transport by negative air pressure pneumatic conveyance, from a source of said ice to a remote location under said negative air pressure, which comprises:

a hollow elongated ice conduit connecting said source of ice and said remote location and providing ice communication therebetween;

a receptor at said remote location for receiving said ice; and

a vacuum pump in fluid communication through a vacuum line with said receptor for withdrawing air from said conduit and creating a vacuum comprising said negative air pressure substantially therethrough said conduit, said air being withdrawn from said conduit to create said negative air pressure in said conduit at a point along said conduit substantially adjacent to or downstream from said receptor, thereby causing said ice to traverse said conduit from said source into said receptor.

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126. A process for conveying ice in the form of a plurality of pieces each having physical characteristics amenable to transport by negative air pressure pneumatic conveyance, from a source of said ice to a remote location under said negative air pressure, which comprises:

a. providing a hollow elongated ice conduit connecting said source of ice and said remote location and providing ice communication therebetween; a receptor at said remote location for receiving said ice; and a vacuum pump in fluid communication through a vacuum line with said receptor for withdrawing air from said conduit and creating a vacuum comprising said negative air pressure substantially throughout said conduit, said negative air pressure causing said ice to traverse said conduit from said source into said receptor;

b. withdrawing air from said receptor and conduit and creating a vacuum comprising said negative air pressure in said receptor and conduit, said air being withdrawn from said conduit to create said negative air pressure in said conduit at a point along said conduit substantially adjacent to or downstream from said receptor; and

c. causing said ice to traverse said conduit from said source into said receptor under the influence of said negative air pressure.

APPENDIX C

ALL CLAIMS 1-164

(Claims on appeal italicized; see Appendix A)

1. Apparatus for conveying ice in the form of a plurality of pieces each having physical characteristics amenable to transport by negative air pressure pneumatic conveyance, from a source of said ice to a remote location under said negative air pressure, which comprises:

a hollow elongated ice conduit connecting said source of ice and said remote location and providing ice communication therebetween;

a receptor at said remote location for receiving said ice; and

a vacuum pump in fluid communication through a vacuum line with said receptor for withdrawing air from said conduit and creating a vacuum comprising said negative air pressure substantially therethrough said conduit, said negative air pressure causing said ice to traverse said conduit from said source into said receptor.

2. Apparatus as in Claim 1 wherein said receptor comprises an ice dispensing device.

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3. Apparatus as in Claim 2 further comprising said dispensing device having dispensing means for dispensing individual quantities of said pieces of ice to an operator of said dispensing device upon demand of said operator.

4. Apparatus as in Claim 3 further comprising said dispensing device also comprising means for dispensing individual quantities of liquid beverages to said operator of said dispensing device upon demand of said operator.

5. Apparatus as in Claim 2 wherein said ice dispensing device comprises a container from which ice is dispensed into a second conduit providing ice communication between said container and another receptor, whereby said ice may be passed from said container to said another receptor.

6. Apparatus as in Claim 6 wherein said another conduit is oriented such that said ice is motivated through said another conduit by the influence of gravity.

7. Apparatus as in Claim 6 further comprising a vacuum pump in fluid communication through a vacuum line with said container and another conduit for withdrawing air from said container and creating a vacuum comprising said negative air pressure in said another conduit, said negative air pressure causing said ice to traverse said another conduit from said container into said another receptor.

8. Apparatus as in Claim 5 wherein said another receptor comprises another ice dispensing device.

9. Apparatus as in Claim 8 further comprising said dispensing device having dispensing means for dispensing individual quantities of said pieces of ice to an operator of said dispensing device upon demand of said operator.

10. Apparatus as in Claim 9 further comprising said dispensing device also comprising means for dispensing individual quantities of liquid beverages to said operator of said dispensing device upon demand of said operator.

11. Apparatus as in Claim 1 wherein said receptor at said remote location comprises an accumulator having therein an openable gate for release therefrom at said remote location of accumulated pieces of ice conveyed thereto from said source.

12. Apparatus as in Claim 11 wherein said accumulator comprises a hollow ice accumulation chamber with an inlet and an outlet, with said inlet disposed proximate to a outlet of said conduit and with said gate openably closing said outlet, and said gate means being disposed at said outlet such that pieces of ice conveyed into said chamber through said conduit by said vacuum come to rest bearing upon said gate.

13. Apparatus as in Claim 12 further comprising said gate being hingedly affixed to said accumulator and biasing means for biasing said openable gate into close contact with said accumulator and closing said outlet.

14. Apparatus as in Claim 13 wherein said biasing means for biasing said openable gate against opening comprises pneumatic means for biasing said openable gate against opening.

15. Apparatus as in Claim 14 wherein said pneumatic means for biasing said openable gate against opening comprises said vacuum comprising said negative air pressure being maintained within said accumulator by said vacuum pump and creating a pressure differential with ambient air pressure external to said accumulator, said pressure differential biasing said openable gate against opening.

16. Apparatus as in Claim 15 wherein weight of said accumulated pieces of ice in said accumulator exerts pressure against said openable gate greater than and opposed to said pressure differential, thereby biasing said gate open and causing said release of said accumulated pieces of ice.

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17. Apparatus as in Claim 15 further comprising vacuum relief means associated with said vacuum line or said conduit for relieving said vacuum in said accumulator and eliminating said pressure differential, thereby allowing said openable gate to open and said accumulated pieces of ice to be released.

18. Apparatus as in Claim 14 further comprising an edge of said outlet of said accumulator comprising a configuration which enhances operation of said pneumatic means for biasing said openable gate.

19. Apparatus as in Claim 18 wherein said outlet of said accumulator is defined by an end of a peripheral wall of said accumulator surrounding said outlet, said end of said wall comprising an interior side of said wall and an exterior side of said wall joined by a width of said wall, said edge of said outlet comprising a junction line of said width and said interior side, said configuration comprises a chamfer across at least a portion of said width and terminating at an apex of an acute angle at said edge.

20. Apparatus as in Claim 13 wherein said biasing means for biasing said openable gate closed comprises mechanical means for biasing said openable gate against opening.

21. Apparatus as in Claim 20 wherein said mechanical means for biasing said openable gate closed comprises spring means or manually operable closure means exerting biasing pressure against said openable gate, thereby biasing said openable gate against opening.

22. Apparatus as in Claim 21 wherein weight of said accumulated pieces of ice in said accumulator exerts pressure against said openable gate greater than and opposite to said biasing pressure exerted by said spring means, thereby biasing said gate open and causing said release of said accumulated pieces of ice.

23. Apparatus as in Claim 21 wherein said mechanical means for biasing comprises means for alternatively manually activating and deactivating said manually operable closure means, such that when said closure means is activated it exerts biasing pressure against said openable gate, thereby biasing said openable gate against opening, and when said closure means is deactivated its biasing pressure against said openable gate is eliminated, thereby allowing said openable gate to open and said accumulated pieces of ice to be released.

24. Apparatus as in Claim 13 wherein said biasing means for biasing said openable gate closed comprises electrical means for biasing said openable gate against opening.

25. Apparatus as in Claim 24 wherein said electrical means for biasing said openable gate closed comprises solenoid means which exerts biasing pressure against said openable first gate, thereby biasing said openable gate against opening.

26. Apparatus as in Claim 25 further comprising means for electrically activating and deactivating said solenoid means, such that when said solenoid means is activated it exerts biasing pressure against said openable gate, thereby biasing said openable first gate closed, and when said solenoid means is deactivated its biasing pressure against said openable gate is eliminated, thereby allowing said openable gate to open and said accumulated pieces of ice to be released.

27. Apparatus as in Claim 12 further comprising said gate and said outlet being disposed in any spacial orientation which will permit said pieces of ice to be released from said accumulator upon opening of said gate.

28. Apparatus as in Claim 27 further comprising said gate and said outlet being disposed generally vertically.

29. Apparatus as in Claim 11 further comprising said accumulator being disposed in proximity to an ice receptacle and said pieces of ice released from said accumulator being deposited into said receptacle.

30. Apparatus as in Claim 29 wherein said accumulator and said ice receptacle are generally vertically aligned with said accumulator above said ice receptacle such that deposit of said accumulated ice discharged from said accumulator into said ice receptacle comprises said ice being dropped under the influence of gravity.

31. Apparatus as in Claim 29 wherein said accumulator and said ice receptacle are disposed with said accumulator at a level above said ice receptacle but offset laterally therefrom and with a second hollow conduit extending therebetween such that deposit of said accumulated ice discharged from said accumulator into ice receptacle comprises said ice traversing through said second hollow conduit.

32. Apparatus as in Claim 31 wherein traversal of said ice through said second hollow conduit occurs at least in part under the influence of gravity.

33. Apparatus as in Claim 31 wherein traversal of said ice through said second hollow conduit occurs at least in part under the influence of momentum of said ice imparted by motion of said ice.

34. Apparatus as in Claim 29 wherein said second hollow conduit comprises flexible tubing.

35. Apparatus as in Claim 29 wherein said second hollow conduit comprises rigid tubing.

36. Apparatus as in Claim 29 wherein said ice receptacle comprises an ice dispensing device.

37. Apparatus as in Claim 36 further comprising said dispensing device having dispensing means for dispensing individual quantities of said pieces of ice to an operator of said dispensing device upon demand of said operator.

38. Apparatus as in Claim 37 further comprising said dispensing device also comprising means for dispensing individual quantities of liquid beverages to said operator of said dispensing device upon demand of said operator.

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39. Apparatus as in Claim 1 or 11 further comprising said vacuum line connecting in fluid communication into said hollow conduit at a first point of connection upstream of a second point of connection of said hollow conduit into said receptor, and spaced apart from said second point of connection by an interval not greater than a distance that said ice pieces can traverse under momentum imparted to them by their prior conveyance by said negative air pressure, such that diversion of at least a portion of conveying force of said negative air pressure at said first point of connection does not prevent said ice pieces from continuing to traverse entirely through said hollow conduit and into said receptor.

40. Apparatus as in Claim 39 further comprising said first point of connection of said hollow conduit and said vacuum line being located in an expanded internal breadth portion of said hollow conduit, such that in said expanded internal breadth portion velocity of air moving under said negative air pressure is diminished relative to velocity of said air in an immediately upstream portion of said hollow conduit.

41. Apparatus as in Claim 39 further comprising said vacuum line and said hollow conduit at said first point of connection being connected at an angle that precludes diversion of said ice pieces from said hollow conduit into said vacuum line.

42. Apparatus as in Claim 39 further comprising said vacuum line at said first point of connection line with said hollow conduit being of a maximum inside width less than minimum breadth of any of said ice pieces, such that diversion of said ice pieces from said hollow conduit into said vacuum line is precluded.

43. Apparatus as in Claim 39 further comprising liquid accompanying said ice and being conveyed therewith, and length of said expanded internal breadth portion of said hollow conduit being sufficiently great that at least a portion of any such liquid being conveyed through said conduit will be diverted into said vacuum line and will not continue to traverse through said hollow conduit and into said receptor.

44. Apparatus as in Claim 43 further comprising a plurality of liquid traps in said vacuum line downstream from said first point of connection, successive ones of said plurality of liquid traps removing successive quantities of said liquid from entrainment in an air stream moving under said negative air pressure, such that no quantity of said liquid remains entrained in said air stream when said air stream reaches said vacuum pump.

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45. Apparatus as in claim 44 wherein a first liquid trap of said plurality of said liquid traps is of a size sufficient to remove all of said liquid from said air stream and a successive one of said plurality of liquid traps comprises a viewing window into said vacuum line to provide for visual confirmation that no liquid reaches said successive one of said plurality of liquid traps.

46. Apparatus as in Claim 11 further comprising a reaccumulator having a inlet and an outlet, disposed exteriorly of and with its said inlet surrounding said inlet of said accumulator, and having an openable door closing its said lower end, such that upon opening of said gate of said accumulator, said ice is discharged into said reaccumulator, and upon completion of said discharge of ice into said reaccumulator said biasing means again biases said gate closed.

47. Apparatus as in Claim 46 further comprising said openable door being hingedly affixed to said reaccumulator and a second biasing means for biasing said openable door into close contact with said reaccumulator and closing said outlet.

48. Apparatus as in Claim 47 wherein said second biasing means for biasing said openable second gate against opening comprises pneumatic means for biasing said openable second gate against opening.

49. Apparatus as in Claim 48 wherein said pneumatic means for biasing said openable door against opening comprises said vacuum comprising said negative air pressure being established in said reaccumulator upon said opening of said openable gate for discharge of said ice into said reaccumulator from said accumulator, said vacuum creating a pressure differential with ambient air pressure external to said reaccumulator, said pressure differential biasing said openable door against opening.

50. Apparatus as in Claim 49 wherein weight of said accumulated pieces of ice in said reaccumulator exerts pressure against said openable door greater than and opposed to said pressure differential, thereby biasing said door open and causing said release of said accumulated pieces of ice.

51. Apparatus as in Claim 49 further comprising closure of said gate of said accumulator relieving said vacuum in said reaccumulator, such that the weight of ice against said door causes said door to open and discharge said ice, such that said apparatus can operate substantially continuously.

52. Apparatus as in Claim 49 wherein said second biasing means for biasing said openable door against opening comprises mechanical means for biasing said openable door against opening.

53. Apparatus as in Claim 52 wherein said mechanical means for biasing said openable door against opening comprises spring means or manually operable closure means exerting biasing pressure against said openable door, thereby biasing said openable door against opening.

54. Apparatus as in Claim 53 wherein weight of said accumulated pieces of ice in said reaccumulator exerts pressure against said openable door greater than and opposite to said biasing pressure exerted by said spring means, thereby biasing said door open and causing said release of said accumulated pieces of ice.

55. Apparatus as in Claim 53 wherein said mechanical means for biasing comprises means for alternatively manually activating and deactivating said closure means, such that when said closure means is activated it exerts biasing pressure against said openable door, thereby biasing said openable door against opening, and when said closure means is deactivated its biasing pressure against said openable door is eliminated, thereby allowing said openable door to open and said accumulated pieces of ice to be released.

56. Apparatus as in Claim 47 wherein said means for biasing said openable second gate against opening comprises electrical means for biasing said openable second gate against opening.

57. Apparatus as in Claim 56 wherein said electrical means for biasing said openable second gate against opening comprises solenoid means which exerts biasing pressure against said openable second gate, thereby biasing said openable second gate against opening.

58. Apparatus as in Claim 57 further comprising means for electrically activating and deactivating said solenoid means, such that when said solenoid means is activated it exerts biasing pressure against said openable second gate, thereby biasing said openable second gate against opening, and when said solenoid means is deactivated its biasing pressure against said openable second gate is eliminated, thereby allowing said openable second gate to open and said accumulated pieces of ice to be released.

59. Apparatus as in Claim 11 further comprising said receptor being disposed adjacent to an inlet of a subsequent conduit leading to a subsequent accumulator at another remote location, and said pieces of ice released from said receptor being deposited into said inlet for conveyance through said subsequent conduit to said subsequent accumulator at said another remote location.

60. Apparatus as in Claim 59 further comprising another vacuum line in fluid communication with said subsequent conduit for moving said ice through said subsequent conduit to said subsequent accumulator at said second remote location.

61. Apparatus as in Claim 59 further comprising a second receptor disposed at said second remote location, said ice passing from said subsequent accumulator into said second ice receptacle.

62. Apparatus as in Claim 61 wherein said second receptor comprises an ice dispensing device.

63. Apparatus as in Claim 62 further comprising said dispensing device having dispensing means for dispensing individual quantities of said pieces of ice to an operator of said dispensing device upon demand of said operator.

64. Apparatus as in Claim 63 further comprising said dispensing device also comprising means for dispensing individual quantities of liquid beverages to said operator of said dispensing device upon demand of said operator.

65. Apparatus as in Claim 1 or 11 further comprising a collector into which ice pieces delivered from said source of ice are received, said collector having a first opening into said first conduit, and further comprising unbridging means associated with said collector for presenting said released ice pieces individually and unbridged to said first opening, whereby said ice pieces pass through said first opening into said first conduit.

66. Apparatus as in Claim 65 wherein said unbridging means also motivates said ice pieces through said opening into said first conduit.

67. Apparatus as in Claim 65 wherein said unbridging means mechanically breaks ice bridges between individual ice pieces existing when said ice pieces are delivered from said source of ice to said collector.

68. Apparatus as in Claim 67 wherein said unbridging means comprises a toothed wheel, auger, paddle wheel, vibrator, moving blade, converging or parallel pair of belts, air lock closure, ice tumbler or rotating centripetal device.

69. Apparatus as in Claim 67 wherein said unbridging means is disposed vertically, horizontally or at an intermediate angle.

70. Apparatus as in Claim 65 further comprising a second opening from said collector into a second conduit and means for directing said ice pieces alternatively to said first opening or said second opening.

71. Apparatus as in Claim 70 further comprising a storage container adjacent said second opening, said storage container comprising means for retrieval of ice pieces therefrom by manual or mechanical means.

72. Apparatus as in Claim 1 or 11 further comprising sensor means for detecting the presence or absence of ice in said receptor.

73. Apparatus as in Claim 72 wherein said sensor means further determines, when the presence of said ice is detected in said receptor, the quantity of ice so detected.

74. Apparatus as in Claim 73 wherein said sensor means periodically measures a parameter value which is dependent upon said quantity of ice and from which said quantity of said ice can be determined.

75. Apparatus as in Claim 74 wherein said parameter comprises ice weight, ice volume, temperature within said ice receptacle, ice surface level or strain within the body of said receptor.

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76. Apparatus as in Claim 74 further comprising:

signal generation means associated with said sensor means for generating a series of signals each of which is determined by the value of a respective one of periodic measurements of said parameter;

comparison means for conversion of each said signal to a respective measure of said quantity of ice in said receptor and comparison of said measure of quantity with a predetermined measure of a desired quantity of said ice in said receptor, said comparison comprising determination of a difference between said quantity of ice in said receptor and said desired quantity of ice at the time of said periodic measurement, said comparison means generating a second signal upon determination that a value of said difference, predetermined to be indicative of presence of less than a minimum acceptable quantity of ice present in said receptor, has been reached;

activation means for ice recharging which is responsive to said second signal and which upon receipt of which activates said apparatus to convey said ice to said receptor until receipt of a subsequent signal from said comparison means, generated upon determination that said predetermined desired quantity of ice in said receptor has been reached, whereupon said activation means in response to receipt of said subsequent signal, deactivates said apparatus and halts conveyance of said ice to said receptor.

77. Apparatus as in Claim 1 or 11 comprising a plurality of said receptors and said conduit having an intermediate division point from which a plurality of branch conduits extend, each branch conduit leading directly or through at least one intermediate further division point from which a subsequent plurality of further branch conduits extend, to an ice communication connection with a respective one of said plurality of receptors.

78. Apparatus as in Claim 77 further comprising a diverter at each said intermediate division point for routing said conveyed pieces of ice into and through any selected one of said plurality of branch conduits at said intermediate division point.

79. Apparatus as in Claim 78 wherein each said diverter further comprises a shifter for aligning said diverter with any selected one of said plurality of branch conduits at said intermediate division point.

80. Apparatus as in Claim 79 wherein said shifter is operated manually, pneumatically, mechanically or electrically.

81. Apparatus as in Claim 78 wherein there are two, three or four alternate branch ice conveyance conduits.

82. Apparatus as in Claim 78 further comprising said vacuum line also having at least one coincident intermediate division point from which an equal plurality of branch vacuum lines extend, each such branch vacuum line forming a pair with a corresponding branch ice conduit and extending to and connecting with a corresponding one of said plurality of receptors, and each said diverter at each said intermediate division point also simultaneously directing said vacuum into and through that branch vacuum line paired with any selected one of said plurality of branch ice conduits.

83. Apparatus as in Claim 82 wherein said diverter further comprises a shifter for motivating routing ice conveyance and direction of vacuum to alternate pairs of corresponding branch ice conveyance conduits and branch vacuum lines.

84. Apparatus as in Claim 83 wherein said shifter is operated manually, pneumatically, mechanically or electrically.

85. Apparatus as in Claim 82 wherein there are two, three or four alternate pairs of corresponding branch ice conduits and branch vacuum lines.

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86. Apparatus as in Claim 1 or 11 further comprising a plurality of said sources of ice, a branch ice conduit extending from each and providing ice communication to an intermediate junction point from which a single ice conduit extends and provides ice communication to said receptor, and a diverter at said intermediate junction point, said diverter routing conveyed pieces of ice from any selected one of said plurality of branch conduits into said single ice conduit at said intermediate division point.

87. Apparatus as in Claim 86 wherein said diverter further comprises a shifter for aligning said diverter with any selected one of said plurality of branch conduits at said intermediate division point.

88. Apparatus as in Claim 87 wherein said shifter is operated manually, pneumatically, mechanically or electrically.

89. Apparatus as in Claim 86 wherein there are two, three or four alternate branch ice conduits from said plurality of ice sources.

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90. Apparatus as in Claim 86 further comprising said vacuum line also having at least one coincident intermediate division point from which an equal plurality of branch vacuum lines extend, each such branch vacuum line forming a pair with a corresponding branch ice conduit and extending to and connecting with a corresponding one of said plurality of ice sources, and each said diverter at each said intermediate division point also simultaneously directing said vacuum into and through that branch vacuum line paired with any selected one of said plurality of branch ice conduits.

91. Apparatus as in Claim 90 wherein said diverter further comprises a shifter for motivating routing ice conveyance and direction of vacuum from alternate pairs of corresponding branch ice conveyance conduits and branch vacuum lines.

92. Apparatus as in Claim 91 wherein said shifter is operated manually, pneumatically, mechanically or electrically.

93. Apparatus as in Claim 92 wherein there are two, three or four alternate pairs of corresponding branch ice conveyance conduits and branch vacuum lines from said plurality of ice sources.

94. Apparatus as in Claim 1 or 11 wherein said source of ice comprises machinery for making pieces of ice, an ice unbridger, a container having said pieces of ice therein and from which said pieces of ice are motivated into to said ice conduit, another conduit in which said pieces of ice are being conveyed and which is in ice communication with said ice conduit or introducer means for introducing said pieces of ice essentially seriatim into said ice conduit.

95. Apparatus as in Claim 1 or 11 wherein at least a portion of said ice conduit is thermally insulated or refrigerated.

96. Apparatus as in Claim 1 or 11 further comprising filtration means for filtering air being drawn into said ice conduit by said negative air pressure.

97. Apparatus as in Claim 1 or 11 further comprising cleaner introducing means for introducing a liquid cleaner into said ice conduit and conveying said liquid cleaner through said ice conduit under said negative air pressure, whereby passage of said cleaner through said ice conduit cleans contaminants from the interior of said conduit, and upon discharge of said cleaner at an outlet of said conduit, removes from said conduit said contaminants entrained in said cleaner.

98. Apparatus as in Claim 97 wherein said cleaner introducing means is disposed relative to said ice conduit such that said liquid cleaner passes through at least a portion of said ice conduit and at least one of said source of ice and said receptor, such that said contaminants are removed therefrom.

99. Apparatus as in Claim 97 further comprising said vacuum line connecting in fluid communication into said ice conduit at a first point of connection upstream of a second point of connection of said hollow conduit into said receptor, and spaced apart from said second point of connection by an interval not greater than a distance that said liquid cleaner can traverse under momentum imparted thereto them by prior conveyance by said negative air pressure though said conduit, said first point of connection of said first hollow conduit and said vacuum line being located in an expanded internal breadth portion of said first hollow conduit, such that in said portion velocity of air moving under said negative air pressure is diminished relative to velocity of said air in an immediately upstream portion of said first hollow conduit, length of said expanded internal breadth portion of said hollow conduit being sufficiently great that at least a portion of said liquid cleaner being conveyed through said conduit will be diverted into said first vacuum line and a remainder of said liquid cleaner will continue to traverse through said first hollow conduit and into said receptor, whereby passage of said cleaner through said ice conduit and receptor cleans contaminants from the interiors of said conduit and receptor, and upon discharge of said cleaner at an outlet of said receptor, removes from said conduit

and receptor said contaminants entrained in said cleaner.

100. Apparatus as in Claim 99 further comprising a plurality of liquid traps in said vacuum line downstream from said first point of connection, successive ones of said plurality of liquid traps removing successive quantities of said liquid cleaner from entrainment in an air stream moving under said negative air pressure, such that no quantity of said liquid cleaner remains entrained in said air stream when said air stream reaches said vacuum pump.

101. Apparatus as in Claim 100 wherein a first liquid trap of said plurality of said liquid traps is of a size sufficient to remove all of said liquid cleaner from said air stream and a successive one of said plurality of liquid traps comprises a viewing window into said vacuum line to provide for visual confirmation that no liquid cleaner reaches said successive one of said plurality of liquid traps.

102. Apparatus as in Claim 1 wherein said receptor at said remote location comprises an air lock device which is connected to said ice conduit on an upstream side and which has an inlet for pressurized air from a source thereof on a downstream side and another conduit extending from said downstream side for passage of said pressurized air, such that ice entering said air lock device from said ice conduit passes through said air lock device and is propelled through said another conduit at high velocity by said pressurized air.

103. Apparatus as in Claim 102 wherein that portion of said another conduit downstream of said air lock comprises flexible tubing with an outlet at an end distal from said air lock device.

104. Apparatus as in Claim 103 further comprising directing means for moving said outlet of said flexible tubing such that ice passing through said flexible tubing at high velocity can be projected from said outlet in various directions and to various distances.

105. Apparatus as in Claim 102 wherein that portion of said another conduit downstream of said air lock comprises flexible tubing with an outlet at an end distal from said air lock device and further comprising directing means for manual, mechanical, pneumatic or electrical positioning of said outlet of said flexible tubing.

106. Apparatus as in Claim 104 further comprising said directing means causing change of said positioning of said outlet end of said flexible tubing frequently or continually.

107. Apparatus as in Claim 102 wherein said source of pressurized air comprises an air compressor, blower or air exhaust from said vacuum pump.

108. Apparatus as in Claim 1, 11, 29, 46 or 102 wherein operation of said apparatus is at least in part controlled by a microprocessor.

109. Apparatus as in Claim 39 wherein operation of said apparatus is at least in part controlled by a microprocessor.

110. Apparatus as in Claim 59 wherein operation of said apparatus is at least in part controlled by a microprocessor.

111. Apparatus as in Claim 65 wherein operation of said apparatus is at least in part controlled by a microprocessor.

112. Apparatus as in Claim 72 wherein operation of said apparatus is at least in part controlled by a microprocessor.

113. Apparatus as in Claim 77 wherein operation of said apparatus is at least in part controlled by a microprocessor.

114. Apparatus as in Claim 86 wherein operation of said apparatus is at least in part controlled by a microprocessor.

115. Apparatus as in Claim 94 wherein operation of said apparatus is at least in part controlled by a microprocessor.

116. Apparatus as in Claim 95 wherein operation of said apparatus is at least in part controlled by a microprocessor.

117. Apparatus as in Claim 96 wherein operation of said apparatus is at least in part controlled by a microprocessor.

118. Apparatus as in Claim 97 wherein operation of said apparatus is at least in part controlled by a microprocessor.

119. A diverter for simultaneous diversion of ice conveyance and vacuum supply in apparatus as in Claim 82, said diverter comprising an ice conduit and vacuum line first port pair, a plurality of ice conduit and vacuum line second port pairs, and an internal shiftable ice conduit and vacuum line pair, said internal shiftable pair being in continual ice and air communication, respectively, with said first port pair, and being capable of shifting traversal between respective ice and air communication with individual pairs of said plurality of second port pairs.

120. A diverter as in Claim 119 wherein said plurality of second port pairs comprises at least four second port pairs.

121. A diverter as in Claim 119 wherein said shifting traversal is manually, mechanically, pneumatically or electrically motivated.

122. A diverter as in Claim 119 wherein said ports in said port pairs are aligned in a 2xN array, wherein N represents the number of said second port pairs, and at least that portion of said shiftable port pair adjacent to said second port pairs is aligned in correspondence therewith.

123. A diverter as in Claim 122 wherein said plurality of second port pairs comprises two, three or four second port pairs.

124. A diverter as in Claim 119 wherein said ports in said port pairs are aligned in a 1x2N array, wherein N represents the number of said second port pairs, and at least that portion of said shiftable port pair adjacent to said second port pairs is aligned in correspondence therewith.

125. A diverter as in Claim 124 wherein said plurality of second port pairs comprises two second port pairs.

126. A process for conveying ice in the form of a plurality of pieces each having physical characteristics amenable to transport by negative air pressure pneumatic conveyance, from a source of said ice to a remote location under said negative air pressure, which comprises:

a. providing a hollow elongated ice conduit connecting said source of ice and said remote location and providing ice communication therebetween; a receptor at said remote location for receiving said ice; and a vacuum pump in fluid communication through a vacuum line with said receptor for withdrawing air from said conduit and creating a vacuum comprising said negative air pressure substantially throughout said conduit, said negative air pressure causing said ice to traverse said conduit from said source into said receptor;

b. withdrawing air from said receptor and conduit and creating a vacuum comprising said negative air pressure in said receptor and conduit; and

c. causing said ice to traverse said conduit from said source into said receptor under the influence of said negative air pressure.

127. A process as in Claim 126 wherein said receptor comprises an ice dispensing device, an accumulator or an air lock device.

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128. A process as in Claim 126 where said receptor comprises an accumulator, said process further comprising

a. providing an openable gate in said accumulator at said remote location;

b. causing pieces of ice conveyed into said accumulator through said conduit by said vacuum to come to rest bearing upon said gate, said gate being biased against opening; and

c. releasing of accumulated pieces of ice conveyed from said source from said accumulator at said remote location by counteracting or eliminating such biasing.

129. A process as in Claim 128 further comprising creating and counteracting said biasing by manual, mechanical, pneumatic or electrical means.

130. A process as in Claim 129 wherein said biasing is created pneumatically, said process comprising

a. maintaining said vacuum comprising negative air pressure within said accumulator by said vacuum pump and creating a pressure differential with ambient air pressure external to said accumulator, said pressure differential biasing said openable first against opening; and

b. said counteracting such pneumatic biasing by accumulating a sufficient quantity of ice pieces in said first accumulator such that weight thereof exerts pressure against said openable gate greater than and opposed to said pressure differential;

such that said gate is biased open and said accumulated ice pieces are released.

131. A process as in Claim 129 wherein said biasing is created pneumatically, said process comprising

a. maintaining said vacuum comprising negative air pressure within said accumulator by said vacuum pump and creating a pressure differential with ambient air pressure external to said accumulator, said pressure differential biasing said openable gate against opening; and

b. said counteracting such pneumatic biasing comprises relieving said vacuum in said accumulator and eliminating said pressure differential;

such that said openable gate is allowed to open and said accumulated pieces of ice are released.

132. A process as in Claim 129 wherein said biasing is created mechanically by pressure exerted by spring means and said counteracting such mechanical biasing comprises accumulating a sufficient quantity of ice pieces in said accumulator such that weight thereof exerts pressure against said openable gate greater than and opposed to said pressure exerted by said spring means, such that said gate is biased open and said accumulated ice pieces are released.

133. A process as in Claim 129 wherein said biasing is created mechanically by manually operable closure means exerting biasing pressure against said openable gate and said counteracting such mechanical biasing comprises alternatively manually deactivating said closure means, whereby said openable gate is allowed to open and said accumulated pieces of ice to be released.

134. Apparatus as in Claim 129 wherein said biasing is created electrically by activating solenoid means which exerts biasing pressure against said openable first gate; and said counteracting said electrically created biasing comprises deactivating said solenoid means to eliminate its biasing, such that said openable gate is allowed to open and said accumulated pieces of ice to be released.

135. A process as in Claim 127 wherein said receptor comprises an ice dispenser, said process further comprising thereafter dispensing individual quantities of said pieces of ice to an operator of said ice dispenser upon demand of said operator.

136. A process as in Claim 127 wherein said receptor comprises an accumulator, said process further comprising discharging accumulated ice from said accumulator into an ice dispenser.

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137. A process as in Claim 136 further comprising thereafter dispensing individual quantities of said pieces of ice to an operator of said ice dispenser upon demand of said operator.

138. A process as in Claim 126 further comprising

a. connecting said vacuum line in fluid communication into said ice conduit at a first point of connection upstream of a second point of connection of said ice conduit into said receptor, and spaced apart from said second point of connection by an interval not greater than a distance that said ice pieces can traverse under momentum imparted to them by their prior conveyance through said conduit by said negative air pressure; and

b. conveying said ice pieces under that amount of force of said negative air pressure at said first point of connection sufficient to cause said ice pieces to continue to traverse entirely through said first conduit and into said receptor without diversion of any ice pieces into said first vacuum line.

139. A process as in Claim 138 further comprising causing velocity of air at said first point of connection and moving under said negative air pressure to be diminished relative to velocity of said air in an immediately upstream portion of said ice conduit by disposing said first point of connection in an expanded internal breadth portion of said first hollow conduit.

140. A process as in Claim 139 further comprising forming said expanded internal breadth portion of said hollow conduit with a length sufficiently great that one portion of any liquid being conveyed through said conduit will be diverted into said first vacuum line and another portion of said liquid will continue to traverse through said ice conduit and into said receptor.

141. A process as in Claim 140 further comprising disposing a plurality of liquid traps in said vacuum line downstream from said first point of connection and removing successive quantities of said liquid from entrainment in an air stream moving under said negative air pressure in successive ones of said plurality of liquid traps, such that no quantity of said liquid remains entrained in said air stream when said air stream reaches said vacuum pump.

142. A process as in Claim 140 wherein said liquid comprises water.

143. A process as in Claim 140 wherein said liquid comprises a liquid cleaner and said process further comprises introducing said liquid cleaner into said ice conduit, conveying said liquid cleaner through said conduit by said negative air pressure and contacting substantially all interior surfaces of said conduit for removal of contaminants therefrom, such that said interior surfaces are cleaned of said contaminants by passage of said liquid cleaner.

144. A process as in Claim 143 further comprising causing at least a portion of said liquid cleaner also to pass through and contact substantially all interior surfaces of at least one of said source of ice and said receptor, such that such that said interior surfaces are cleaned of said contaminants by passage of said liquid cleaner.

145. A process as in Claim 126 wherein said receptor comprises an ice dispenser and further comprising detecting the presence of ice in said ice dispenser.

146. A process as in Claim 145 further comprising determining the quantity of ice so detected.

147. A process as in Claim 146 wherein said determining comprises periodically measuring a parameter value of said ice dispenser which is dependent upon said quantity of ice contained in said ice dispenser and from which said quantity of said ice can be determined.

148. A process as in Claim 147 wherein said parameter comprises contained ice weight, contained ice volume, temperature within said ice dispenser, ice surface level within said ice dispenser or strain within the body of said ice dispenser.

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149. A process as in Claim 146 further comprising determining a desired minimum quantity of ice to be maintained in said ice dispenser, periodically determining said quantity of ice so detected, comparing said quantity of ice detected with said desired minimum quantity of ice, and if said quantity of ice detected is less than said desired minimum quantity of ice, causing sufficient ice to be conveyed to said ice dispenser to increase the quantity of ice present to at least said desired minimum quantity of ice.

150. A process as in Claim 146 further comprising predetermining an incremental quantity of ice to be delivered to said ice dispenser during each conveyance period and causing said incremental quantity to be conveyed to said ice dispenser when determination of said quantity of ice detected indicates that an equivalent incremental quantity of ice has been removed from said ice dispenser since the last previous conveyance of ice to said ice dispenser.

151. A process as in Claim 126 further comprising receiving ice pieces delivered from said source of ice in at least partially bridged condition, and unbridging said ice pieces prior to delivering said ice piece into said ice conduit.

152. A process as in Claim 151 further comprising simultaneously unbridging said ice pieces and motivating said ice pieces toward said ice conduit to which said ice pieces are delivered in unbridged condition.

153. A process as in Claim 151 wherein unbridging comprises mechanically breaking ice bridges between individual ice pieces existing when said ice pieces are delivered from said source of ice to said collector.

154. A process as in Claim 126 wherein said pieces of ice comprise cube ice, flake ice, nugget ice, bridged ice, granular ice, chunk ice or crushed ice.

155. A process as in Claim 126 comprising conveying said ice through a plurality of serially connected conduits to reach said receptor.

156. A process as in Claim 126 comprising forming at least one serial connection between two sequentially aligned conduits through a diverter.

157. A process as in Claim 156 further comprising disposing one of said two sequentially aligned conduits as one of a plurality of conduits which can be alternately connected to the other of said two sequentially aligned conduits through said diverter.

158. A process as in Claim 126 comprising conveying said ice and vacuum through a plurality of paired, serially connected conduits to reach said receptor.

159. A process as in Claim 158 comprising forming at least one serial connection between two sequentially aligned paired ice and vacuum conduits through a diverter.

160. A process as in Claim 159 further comprising disposing one of said two sequentially aligned paired ice and vacuum conduits as one of a plurality of paired ice and vacuum conduits which can be alternately connected to the other of said two sequentially aligned paired ice and vacuum conduits through said diverter.

161. A process as in Claim 160 wherein said plurality of paired ice and vacuum conduits comprises two, three or four paired ice and vacuum conduits.

162. A process as in Claim 127 wherein said receptor comprises an air lock device and said process further comprises providing for said air lock device an air communication connection to a source of pressurized air on a downstream side thereof and ice and air communication with another conduit extending from said downstream side and having an outlet end distal to said air lock device, for passage of said pressurized air, and causing ice to enter said air lock device from said ice conduit and pass therethrough to encounter pressurized air moving at high velocity on said downstream said and become entrained in said pressurized air moving at high velocity and be propelled through said another conduit and thereby be dispersed at high speed from said outlet end of said another conduit.

163. A process as in Claim 162 further comprising providing as said source of pressurized air an air compressor, a blower or an air exhaust of said vacuum pump.

164. Apparatus as in Claim 1 or 11 comprising a plurality of said receptors or said ice sources and said conduit having an intermediate division point from which a plurality of branch conduits extend, each branch conduit leading directly or through at least one intermediate further division point from which a subsequent plurality of further branch conduits extend, to an ice communication connection with a respective one of said plurality of receptors or ice sources.